

First Named Inventor: Stan V. Lyons

Application No.: 09/685,779

-2-

AMENDMENTS TO THE CLAIMS

Please cancel claims 1-4, 6, 7, 13 and 14, and amend claims 5, 9, 11 and 12, such that the status of the claims is as follows:

1-4. (Canceled)

5. (Currently amended) An irradiation system comprising:

a radiation source for providing a ~~radiation~~ an electron beam at a first controlled intensity, the ~~radiation~~ electron beam having a beam current and having at least an x-ray component with a second intensity that is proportional to the first intensity;

a current sensor coupled to the radiation source for measuring the beam current provided by the radiation source;

a product location system for advancing the product past the ~~radiation~~ electron beam at a controlled speed, so that the ~~radiation~~ electron beam impinges on the product;

a sensor system for measuring a third intensity of a portion of the x-ray component of the ~~radiation~~ electron beam that passes through the product;

a control system for calculating the second intensity of the x-ray component of the ~~radiation~~ electron beam based on the measured beam current provided by the radiation source, and for adjusting the first intensity of the ~~radiation~~ electron beam based on an absorbed radiation dose which is based on a difference between the third intensity of the portion of the x-ray component of the ~~radiation~~ electron beam that passes through the product and the second intensity of the x-ray component of the ~~radiation~~ electron beam.

First Named Inventor: Stan V. Lyons

Application No.: 09/685,779

-3-

6. (Canceled) The irradiation system of claim 5, wherein the radiation source provides an electron beam.

7. (Canceled) The irradiation system of claim 5, wherein the radiation source provides an x-ray beam.

8. (Original) The irradiation system of claim 5, wherein the sensor system includes a scaled linear x-ray sensor array.

9. (Currently amended) The irradiation system of claim 8, wherein the sensor system further includes an attenuator plate for scaling the third intensity of the portion of the x-ray component of the radiation electron beam that passes through the product to correspond with a dynamic range of the linear x-ray sensor array.

10. (Original) The irradiation system of claim 5, wherein the product location system comprises a conveyor.

11. (Currently amended) An irradiation system comprising:

 a radiation source for providing a radiation an electron beam having a beam current and having a first intensity profile, the radiation electron beam having at least an x-ray component with a second intensity profile that is proportional to the first intensity profile;

 a current sensor coupled to the radiation source for measuring the beam current provided by the radiation source;

 a product location system for providing product so that the radiation electron beam impinges on the product;

First Named Inventor: Stan V. Lyons

Application No.: 09/685,779

-4-

a sensor system for measuring a third intensity of a portion of at least part of the x-ray component of the radiation electron beam that passes through the product; a control system for calculating the second intensity profile of the x-ray component of the radiation electron beam based on the measured beam current provided by the radiation source, and for interpreting measurements taken by the sensor system to determine a relative location and type of the product that the radiation electron beam impinges upon, the control system being responsive to the determined relative location and type of the product to adjust at least one of the first intensity profile of the radiation electron beam, a location pattern of successive radiation electron beams, and a speed of advancement of product by the product location system.

12. (Currently amended) A method of irradiating product, comprising:

providing a radiation an electron beam having a controlled beam current;
measuring the beam current of the radiation electron beam;
directing the radiation electron beam onto product;
measuring an intensity of a portion of the radiation electron beam that passes through the product;
calculating an intensity of the provided radiation electron beam based on the measured beam current; and
adjusting the beam current of the provided radiation electron beam to adjust its intensity, based on a difference between the measured intensity of the portion of the radiation electron beam that passes through the product and the calculated intensity of the provided radiation electron beam.

13. (Canceled) The method of claim 12, wherein providing a radiation the electron beam comprises generating an electron beam.

First Named Inventor: Stan V. Lyons

Application No.: 09/685,779

-5-

14. (Cancelled) The method of claim 13, wherein providing a radiation beam further comprises converting the electron beam to an x-ray beam.

15. (Original) The irradiation system of claim 12, wherein directing the radiation beam onto product comprises advancing product past the radiation beam on a conveyor.

16. (Previously added) An irradiation system comprising:

a radiation source comprising:

an accelerator for providing an electron beam having a beam current
a current sensor coupled to the accelerator for measuring the beam current of
the electron beam;

a magnet assembly for controllably shaping and directing the electron beam;
and

a scan horn providing an exit path for the electron beam;
a product location system for providing product so that the electron beam impinges
on the product;

a radiation sensor system for measuring an intensity of an x-ray portion of the
electron beam that passes through the product; and

a control system for calculating a first radiation dose based on the beam current
measured by the current sensor, a second radiation dose based on the intensity
of the x-ray portion of the electron beam that passes through the product
measured by the radiation sensor, and an absorbed radiation dose based on a
difference between the first radiation dose and the second radiation dose, and
for adjusting a power level of the electron beam provided by the radiation
source based on the absorbed radiation dose.

First Named Inventor: Stan V. Lyons

Application No.: 09/685,779

-6-

17. (Previously added) The irradiation system of claim 16, wherein the radiation source further comprises a conversion plate for converting the electron beam into an x-ray beam as the electron beam exits that scan horn.